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TAMPER WITH PIVOTING HANDLE

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TAMPER WITH PIVOTING HANDLE

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] Embodiments of the present invention generally relate to tools and tool storage and display mechanisms. The invention more particularly relates to tampers or tamping tools. Still further, the invention pertains to a tamper or tamping tool that includes a pivoting handle assembly configured to pivot between various orientations relative to a tamping base.

Description of the Related Art

[0002] In the tool industry, it is desirable to display tools in an organized and presentable manner while conserving space in a retail environment. In addition, it is desirable for the consumer to be able to transfer and store a tool with less space requirements. One way in which, this can be achieved is through the incorporation of a pivotal or foldable handle on the tool.

[0003] Folding handle mechanisms for particular tools are readily known within the art. For instance, camping or "army" shovels generally incorporate a spade on a shank or handle, wherein the spade is adjoined to the handle by a pivoting mechanism. In general, the pivoting mechanism is located at the business end or head of the spade, thereby allowing the spade to be pivotally fixed in a variety of orientations relative to the handle. The pivoting mechanism typically incorporates a collar threaded on to the handle that is tightened against one of a plurality of planar surfaces within the pivoting mechanism. Each planar surface is configured to rigidly orient the spade in a particular direction by allowing the shank to securely tighten against the surface. In order to change the orientation of the spade, the collar is loosened from the planar surface until the distance required for the collar to clear the planar surface is achieved, thereby allowing the handle to pivot away from the surface. The handle can then be pivoted to another direction, wherein a planar surface is configured to secure the handle in that particular direction.

[0004] Figure 1 provides a schematic view of an exemplary tamper or tamping tool **10** well known by a person of ordinary skill in the art. A tamper is generally used for packing or compressing material, such as clay, sand, or dirt, by a sequence of strikes. For instance, a tamper can be used to compress stone dust or sand, in order to form a solid foundation for walkways or patios made from brick or stone. It is also common practice to tamp clay, sand, or dirt into a drill hole above an explosive device to effectively direct the force of the explosion. A tamper can also be used to simply tamp a section of earth or loose soil to create a smooth area. Typically the tamper **10** includes a square tamping base **12** with the dimensions of 8 inches by 8 inches or 10 inches by 10 inches along the edge of the base **12**. The base **12** is fixably attached to an elongated handle or shank **11**. The handle **11** and base **12** are affixed at a juncture **14** disposed at the center of the base **12** on an upper portion thereof. The handle **11** includes a gripping surface **15** disposed at an end of the handle **11** opposite to the base **12**. The gripping surface **15** allows the user to ergonomically operate the tamper **10** by providing a non-slip surface for the user to manually elevate and lower the tamper **10** onto the desired surface. The soil or dirt is compressed by lowering the bottom surface **13** of the base **12** onto the soil or dirt and applying a downward force. The base **12** is generally manufactured as one piece from steel or iron to allow a significant amount of force to be applied to the surface desired for tamping. The handle **11** can be constructed from iron, steel, fiberglass, wood, or hardened plastic so long as the handle **11** can resist the force imparted on the surface by the base **12**.

[0005] As shown in Figure 1, the tamper **10** does not include a pivoting mechanism or a foldable handle. The bottom surface **13** of the tamping base **12** is, as shown, substantially normal to the longitudinal axis of the handle. Furthermore, since the handle **11** is disposed on a center portion of the tamping base **12**, the base **12** occupies a significant amount of space being that the base **12** protrudes axially in all directions from the handle **11**. Therefore, a need exists for a tamper having a foldable or pivotal handle for substantially reducing the area occupied by the tamper during transportation, display, and storage of the tamper. Further, there is a need

for a tamper having a foldable or pivotal handle that has the structural integrity to shoulder the amount of force required during a tamping operation.

SUMMARY OF THE INVENTION

[0006] The present invention provides apparatus and methods for pivoting a handle on a tamper tool between a plurality of positions. In one embodiment of the present invention, a tamper tool assembly first includes a pivoting handle assembly. The tamper tool assembly includes an elongated handle having a collar attached to a distal end, a tamping base having an upper surface and a lower surface, and a housing member disposed on the upper surface of the tamping base. The housing member includes a plurality of clamping surfaces and a joint configured to pivotally receive the elongated handle.

[0007] A method of pivoting a handle on a tamper tool assembly having a tamping base according to one embodiment of the present invention is also provided. The handle is pivoted on the tamper tool by first providing a housing member on an upper surface of the tamping base, wherein the housing member includes a plurality of clamping surfaces and a joint configured to pivotally receive the elongated handle. A collar is provided on a threaded portion of the handle, wherein the collar is frictionally engaged to a first clamping surface. The collar is then loosened along the threaded portion of the handle, thereby disengaging the collar from the first clamping surface. The handle is then pivoted into alignment with a second clamping surface and then the collar is tightened along the treaded portion into frictional engagement with the second clamping surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are

therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

[0009] Figure 2 presents an elevational side view of a tamper tool according to one embodiment of the present invention.

[0010] Figure 3 shows a perspective view of the tamper according to one embodiment of the invention.

[0011] Figure 4 provides a sectional side view of the tamper according to the embodiment of the present invention illustrated in Figure 3.

[0012] Figure 5 provides a schematic view of a topside of the tamping tool according to an embodiment of the present invention.

[0013] Figure 6 provides a perspective view of the tamping tool according to one embodiment of the present invention.

[0014] Figure 7 is a sectional view of a topside of the tamping tool as illustrated in Figure 6.

[0015] Figure 8 provides a cross-sectional side view of a tamper having a handle assembly with a two-part construction according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Embodiments of the present invention generally relate to an apparatus and method for providing a folding or pivoting handle assembly for a tamper or tamping tool. Particularly, embodiments of the present invention relate to tamper that includes a folding design, thereby allowing a tamping base to be securely and firmly oriented in a plurality of orientations.

[0017] Figure 2 presents an elevational side view of a tamper tool **20** according to one embodiment of the present invention. The tamper tool shown in Figure 2

includes a tamping base **22** and a handle assembly or elongated shank **21**. The tamping base **22** includes a planar portion **23** disposed at a bottom portion. The planar surface **23** is shown as a rectangular shape; however, it is understood that other shapes such as a circular or amorphous shape can be used to define the planar surface **23** on the base **22**. A tamping base **22** with straight edges, such as in Figure 2, is advantageous for tamping an area with a defined border. The tamping base **22** also includes a centrally disposed housing member **33**. The housing member **33** serves to receive the distal end of the handle assembly **21**, which will be discussed in further detail below. As shown in Figure 2, the tamping base **22** also includes a plurality of reinforcement members **32** disposed between the tamping base **22** and the housing member **33**. The reinforcement members **32** consist of a planar coupling or gusset that forms a substantially right angle between the housing member **33** and a topside (**24** in Figure 3) of the tamping base **22**.

[0018] As shown in Figure 2, the handle assembly **21** includes an engagement means **26**, such as a collar, disposed at a distal end adjacent to the tamping base **22**. The collar **26** can be adjoined to the handle assembly **21** by any means well known within the art, such as by a threaded means (**35** in Figure 3). In one embodiment of the present invention, the threaded portion **35** of the handle may be an integral part of the handle assembly **21**. In another embodiment of the present invention, the handle assembly **21** has a two-part construction, wherein the threaded portion **35** is manufactured out of a different material than the remaining portion of the handle assembly **21**. For instance, the threaded portion **35** of the handle assembly **21** can be manufactured from aluminum or steel, while the remaining portion of the handle assembly **21** is constructed out of lighter material, such as wood or fiberglass. The embodiment of the present invention having a two-part handle assembly **21** construction will be discussed in further detail with regard to Figure 8. Referring again to Figure 2, a plurality of male coupling members **27** is disposed around the collar **26**. The male coupling members **27**, as shown in Figure 2, are disposed substantially equidistant from each other. The handle assembly **21** also includes a gripping member **25** disposed at a proximal end. The gripping

member **25** is designed to provide a non-slip surface for the user to elevate and lower the tamper **20** during operation.

[0019] Figure 3 shows a perspective view of the tamper **20** according to one embodiment of the invention. As shown in Figure 3, the housing member **33** is open at a top portion and a side portion. These openings allow the handle assembly to pivot downward in the direction of the open side portion until contacting the topside **24** of the tamping base **22**. In this perspective, a threaded portion **35** of the handle assembly **21** is shown disposed within the housing member **33**. In one embodiment, the handle assembly **21** is pivotally adjoined to the housing member **33** and thereby to the tamping base **22** by a bolt **29**. The pivot bolt **29** is disposed through the housing member **33** and through the distal end of the handle assembly **21** and is secured onto the two opposing sides of the housing member **33**. In another embodiment, a pivot bolt **29** is disposed through an angled slot incorporated into the distal end of the handle assembly **21**. This embodiment will be described in further detail below. However, it is understood that any pivoting means, such as a pin, known to a person of ordinary skill in the art can be used to effectively pivot the handle assembly.

[0020] Referring again to Figure 3, the housing member **33** also includes a primary and a secondary clamping surface, **40** and **41**, respectively, designed to abut a lower planar surface of the collar **26**. The primary clamping surface **40** includes the planar edges of the open top portion of the housing member **33**. As shown in Figure 3, the collar **26** is in an engaged position with the primary clamping surface **40**, wherein the collar **26** is tightened against the primary clamping surface **40** thereby preventing the handle assembly **21** from pivoting downward. However, it is understood that the threaded collar **26** is only one way of clamping the handle **21** to the tamping base **22** and other engagement means known to a person of ordinary skill in the art, such as "over-center" cams or cams in conjunction with a threaded means, can be employed. Having been clamped against the primary surface **40**, the handle assembly **21** is oriented in a substantially perpendicular relationship to the tamping base **22**. This orientation allows the user to effectively operate the tamping tool **20** by elevating the tool **20** and pushing the tool **20** downward against the

surface desired for tamping. The secondary clamping surface **41** includes the planar edges of the open side portion of the housing member **33** protruding from the top portion **24** of the tamping base **22**. Once the collar **26** is loosened from the primary clamping surface **40** the handle assembly **21** can pivot downward and the collar **26** can then be tightened against the secondary clamping surface **41**. The tamping tool **20** with respect to this position will be described in further detail below. An intermediate arcuate profile **28** is disposed on an upper portion of the housing member **33** between the primary and secondary clamping surfaces **40**, **41**. The arcuate profile **28** facilitates the pivoting of the handle assembly between the clamping surfaces **40**, **41** while maintaining a substantially planar surface on the clamping surfaces **40**, **41** by reducing the length that the collar **25** needs to be loosened in order to pivot.

[0021] Figure 4 provides a sectional side view of the tamper **20** according to the embodiment of the present invention illustrated in Figure 3. The handle assembly **21** is oriented in a vertical position and is tightened against the primary clamping surface **40** of the housing member **33**. In this operational position, the longitudinal axis of the handle assembly **21** is oriented substantially perpendicular to the planar tamping or working surface **23** of the tamping base **22**. As shown in Figure 4, the distal end of the handle assembly **21** has a threaded portion **35** for receiving the collar **26**, which has a threaded inner surface (not shown) configured to mate with the threaded portion **35** of the handle assembly **21**. In one embodiment of the present invention, the handle assembly **21** also includes a washer assembly **30** disposed between the bottom of the collar **26** and the housing member **33**. As shown in Figure 4, the washer assembly **30** includes a Teflon washer **53** disposed between two stainless steel washers **51**, **52**. Teflon is advantageous due to its very low coefficient of friction. In particular when sliding against a polished, stainless steel surface, Teflon experiences a very small amount of friction. Stainless steel washers are preferable due to their resistance to corrosion, thereby maintaining a low coefficient of friction. The stainless steel washers can be effectively replaced by washers that also resist corrosion, such as heat-treated steel washers, coated or plated steel washers, or brass washers. In one embodiment, the Teflon washer can

be any polymer having a good impact resistance and a low coefficient of friction, such as nylon. Although the Teflon washer **53** decreases the friction undergone by the washer assembly **30**, the Teflon washer **53** is not an essential component of the washer assembly **30**. In one embodiment, only the steel washers **51**, **52** are included in the washer assembly **30** to reduce the friction created between the collar **26** and the particular clamping surface, **40** or **41**.

[0022] The washer assembly **30** serves to minimize the friction between the collar **26** and the clamping surfaces **40**, **41**. This reduction in friction will allow a given amount of torque placed on the threaded collar to result in a greater separation force between the collar **33** and the clamping surfaces **40**, **41**. As the separation force is increased, the rigidity of the engagement between the handle assembly **21** and the clamping surface **40**, **41** will increase, thereby minimizing wear resulting from the impact of loading and thus increasing the overall life of the tamping tool **20**. In another embodiment of the present invention, the washer assembly **30** includes a roller thrust bearing (not shown) instead of the Teflon washer **53** and the steel washers **51**, **52**. The roller thrust bearing will also minimize the frictional forces between the collar **26** and the clamping surfaces **40**, **41**, thereby maximizing the joint rigidity.

[0023] Figure 5 provides a schematic view of a topside of the tamping tool **20** according to an embodiment of the present invention. As shown in Figure 5, the tamping base **22** has a substantially square profile and the handle assembly **21** is substantially centrally disposed on the tamping base **22** within the housing member **33**. The handle assembly **21** being centrally disposed on the tamping base **22** functions to centrally balance the tamping base **22** while in an operational position, thereby stabilizing the tamping base **22** on the handle assembly **21** during operation. Each reinforcement member **32** extends from the housing member **33** along the vertical edge of the housing member **33** and along the upper surface **24** of the tamping base **22** until reaching a corner of the rectangular tamping base **22** profile. The reinforcement member **32** arrangement provides a substantial amount of support between the tamping base **22** and the housing member **33** while not adding a large amount of weight to the tamping base **22**. As shown in Figure 5, the washer

assembly **30** protrudes radially from a lower portion of the collar **26**. The washer assembly **30** covers a significant portion of the primary clamping surface **40**.

[0024] Figure 6 provides a perspective view of the tamping tool **20** according to one embodiment of the present invention. As shown in Figure 6, the handle assembly **21** has been pivoted into a "storage" or secondary position, wherein the collar **26** has been tightened against the secondary clamping surface **41**. In the secondary position, the longitudinal axis of the handle assembly is substantially parallel to the planar tamping surface **23**. This position allows the tamping tool **20** to be stored, transported, and displayed in a more efficient and space-saving manner by significantly reducing the amount in which the tool **20** extends axially with respect to the longitudinal axis of the handle assembly **21**. Referring again to Figure 6, the collar **26** has been loosened sufficiently from an engaged position with the primary clamping surface **40** (Figure 5) to allow the washer assembly **30** and the collar **26** to clear the arcuate intermediate portion **28** between the primary and secondary clamping surfaces **40**, **41** as the handle assembly **21** is pivoted from an "operational" position to a "storage" position.

[0025] Figure 7 is a sectional view of a topside of the tamping tool **20** as illustrated in Figure 6. As shown in Figure 6, the washer assembly **30** is firmly tightened to the secondary clamping surface **41**. In one embodiment, the threaded portion **35** of the handle assembly **21** extends from adjacent to where the collar **26** is positioned in Figure 7 to the tip of the distal end of the handle assembly **21**. This configuration of the threaded portion **35** improves the manufacturing process of the tool **20** by reducing the area that collar will slide on the handle assembly **21** before being threaded onto the handle assembly **21** when attached from the distal end of the handle assembly **21**. However, it is understood that only a small portion of the handle assembly **21** needs to be threaded so long as the collar **26** can be tightened and loosened along the threaded portion **35** sufficiently to pivot the handle assembly **21** into the desired orientation.

[0026] As previously described, the distal end of the handle assembly **21** can include an angled slot as opposed to a standard cylindrical hole for receiving the pivot bolt

29, wherein the pivot bolt **29** is disposed through the angled slot and the sidewalls of the housing member **33**. The slot is angled such that when the collar **26** is tightened against the secondary clamping surface **41**, the slot will "cam" the handle against a sidewall of the housing member **33**. This added support provides a more rigid interface between the tamper base **22** and the handle assembly **21**.

[0027] Figure 8 provides a cross-sectional side view of a tamper **20** having a handle assembly **21** with a two-part construction according to one embodiment of the present invention. As shown in Figure 8, the handle assembly **20** includes an upper member **55** and a lower member **56**. The upper member **55** includes a gripping portion (not shown) that allows the user to efficiently control the movement of the tamper **20**. The lower member **56** is attached to both the upper member **55** of the handle assembly **21** and to the collar **26**. As previously described, the lower member **56** can be manufactured from a different material than the upper member **55**. In one embodiment, the upper member **55** of the handle assembly **21** is manufactured from wood or fiberglass and the lower member **56** is manufactured from aluminum or steel.

[0028] This two-part construction allows the handle assembly **21** to be optimized for operation. Manufacturing the lower member **56** out of aluminum or steel allows threads to be adequately created on the handle assembly **21** while preserving the handle's **21** structural integrity. A wooden or fiberglass upper member **55** of the handle assembly **21** advantageously reduces or dampens the vibrations that reach the user's hand during normal operation of the tamping tool **20**. The upper member **55** can also be manufactured out of metal. Constructing the upper member **55** out of wood or fiberglass also greatly reduces the overall weight of the tamper **20** thereby allowing for easier operation by the user. However, it is understood that other materials well known in the art that can reduce vibrations in the handle assembly **21** can be used for the upper member **55** and other materials well known in the art that can maintain sufficient structural integrity when threaded can be used for the lower member **56** of the handle assembly **21**.

[0029] In one embodiment of the present invention, the lower member **56** of the handle assembly **21** is adjoined to the upper member **55** by an upper locking mechanism **57** and lower locking mechanism **58**, as shown in Figure 8. The locking mechanisms **57**, **58** serve to effectively lock the lower member **56** to the upper member **55** and to position the lower member **56** at the desired location on the handle assembly **21**. However, it is understood that any attachment means well known to person of ordinary skill in the art can be employed to adjoin the two members **55**, **56** of the handle assembly. For example, a fiberglass upper member **55** can be securely attached to the lower member **56** using an epoxy glue or resin. A shoulder portion **59**, which protrudes radially from the lower member **56** of the handle assembly **21**, prevents the upper member **56** from sliding too far down over the lower member **56** and serves to transmit the force imparted by the user on the upper member **55** of the handle assembly **21** to the lower member **56**, thereby transmitting force to the tamping base **22**. Force is also transmitted from the upper member **55** to the lower member **56** via the locking mechanism or attachment means used to adjoin the two members **55**, **56**.

[0030] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.